

Date: Thursday, 5/3/2007 11:35:48 AM  
 User: Kim Johnston

## Process Sheet

Customer	CU-DAR001 Dart Helicopters Services	Drawing Name	412 X-TUBE INST,LOW NARROW AFT
Job Number	32184	Part Number	D412664205
Estimate Number	12817	Drawing Number	D412-664 UNDER REV
P.O. Number	N/A	Project Number	N/A
This Issue	5/3/2007	Drawing Revision	JHR C JLM
Prsht Rev.	NC	Material	N/A
First Issue	N/A	Due Date	6/15/2007
Previous Run	32183	Qty:	1 Um: Each
Written By			
Checked & Approved By	<u>1807.05.03</u>		
Comment	Est Rev:A New Issue 07-04-05 JLM		

## Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
1.0	DC	DOCUMENT CONTROL  <b>Comment: DOCUMENT CONTROL</b> Photocopy bluefile and create labels as per PPP D412-664-205 CHG001 <b>CZ</b> <b>K5 07.05.30</b>
2.0	PACKAGING 1	PACKAGING RESOURCE #1  <b>Comment: PACKAGING RESOURCE #1</b> Pick Packing Kit
3.0	D412664245	CROSSTUBE ASSEMBLY, LOW NARROW AFT, 412C  <b>Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)</b> Crosstube 412 Low Batch: <u>B32211</u>
4.0	AN640A	Bolt  <b>Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)</b> Bolt Batch: <u>M103446 ✓ M19185 ✓</u>
5.0	AN641A	Bolt  <b>Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)</b> Bolt Batch: <u>M101428 ✓ ✓</u> <b>7/6/21</b> <b>59</b>

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes  No  DQA:  Date: 0106/20  
 QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services		Drawing Name: 412 X-TUBE INST,LOW NARROW AFT
Job Number: 32184		Part Number: D412664205
Job Number: 		
Seq. #:	Machine Or Operation:	Description :
6.0	MS21042L6 	Nut 
Comment: Qty.: 6.0000 Each(s)/Unit Total : 6.0000 Each(s) Nut Batch: <u>M101660</u> ✓ ✓		
7.0	AN960JD616 	Washer 
Comment: Qty.: 18.0000 Each(s)/Unit Total : 18.0000 Each(s) Washer Batch: <u>M103641</u> ✓ ✓ 7/6/21 SG		
8.0	QC4 	INSPECT 100% KITS FOR COMPLETENESS 
Comment: INSPECT 100% KITS FOR COMPLETENESS 107/6/22 ① C207104122 ①		
9.0	PACKAGING 1 	PACKAGING RESOURCE #1 
Comment: HAND FINISHING RESOURCE #1 Identify and pack for shipping as per PPP D412-664-105 Draft 8/7/22 ①		
10.0	QC21 	FINAL INSPECTION/W/O RELEASE 
Comment: FINAL INSPECTION/W/O RELEASE 107/6/22 ①		
Job Completion 		332211 

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

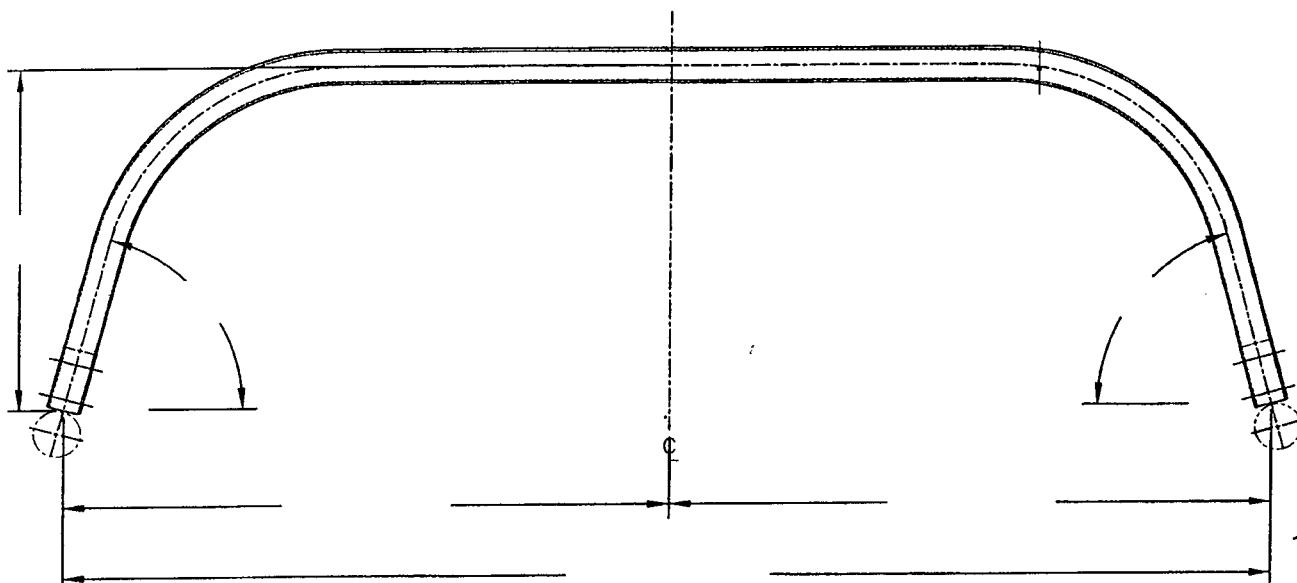
Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_  
 QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order:	32184
Description: Crosstube Low Narrow Aft (412)	Part Number:	D412-664-205
Inspection Dwg: D412-664-245	Rev: C	Page 1 of 1

Required Dimension	Min	Max
Height	16.69	16.95
1/2 Span	46.47	46.73
Angle	49°	52°
Total Span	92.94	93.46



Comments

QC15 Inspection	
Date	

Rev	Date	Change	Revised by	Approved
A	07.04.27	New Issue	KJ/JM	<i>[Signature]</i>

**DART**

DESIGN	DRAWN BY	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA		
CHECKED	APPROVED	DRAWING NO.		REV. C
		D412-664-245		SHEET 1 OF 3
DATE		TITLE		SCALE
07.03.29		CROSSTUBE ASS'Y (412 LOW-N AFT)		NTS
A	06.12.01	NEW ISSUE		
B	07.03.01	CHG CUFF AREA, CHG RUBBER CUSHION		
C	07.03.29	CHG RIVET AND RUBBER CUSHION		

**RELEASED**

07.04.24

**PARTS LIST:**

Qty	Part Number	Description
X	D412-664-245	CROSSTUBE ASSEMBLY (412 LOW-NARROW AFT)
1	D6009-129	CROSSTUBE
2	D2856-600-1009	ABRASION STRIP
1	D2896-1	SUPPORT
2	D3189-1	CHAFING SHIELD
2	D3595-063-570	RUBBER CUSHION
2	D3606-1	CUFF
44	CR3212-4-07	RIVET (OR M7885/3-4-07)
4	MS21920-28	CLAMP
2	MS21920-30	CLAMP (OR MS21920-32)
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
A/R	SIKAFLEX-241/-291	SEALANT (OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT)

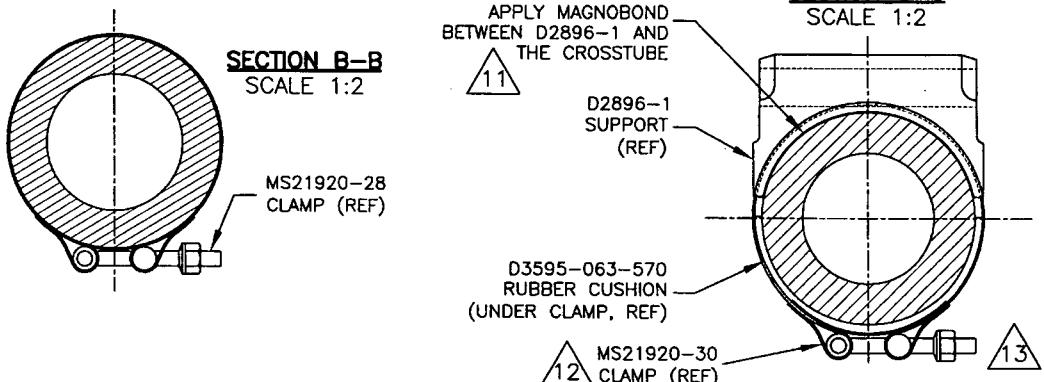
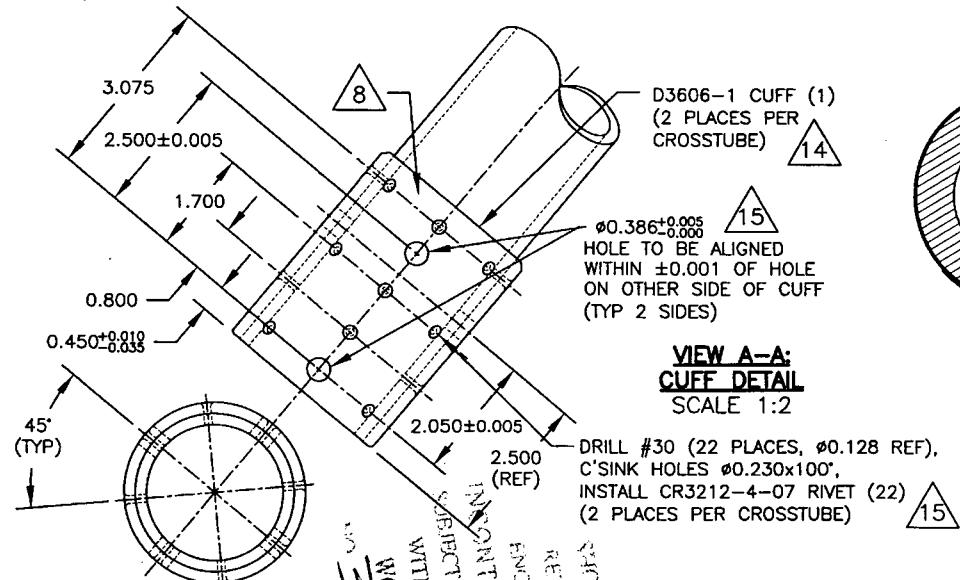
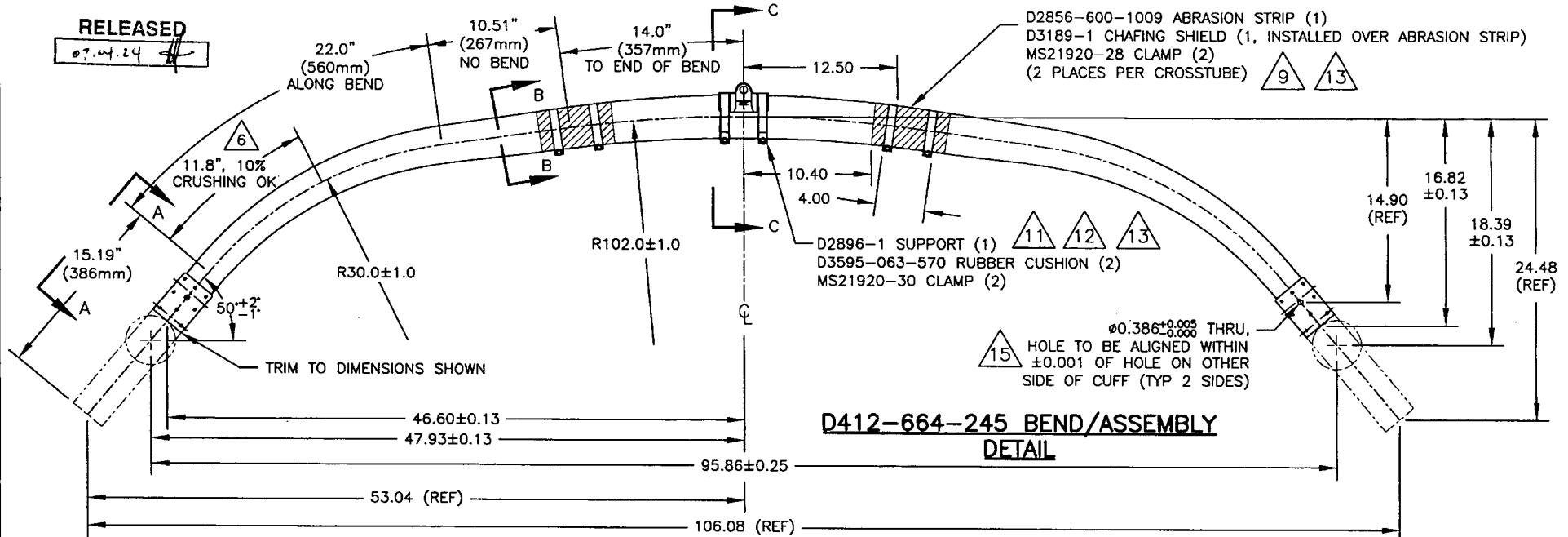
**GENERAL NOTES:**

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 2) MATERIAL: MANUFACTURED FROM D6009-129  
FINISHED LENGTH =  $123.59 \pm 0.020$  (BEFORE BENDING/TRIMMING)
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE.
- 5) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 6) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO  
BENDING IS 6% BASED ON O.D., EXCEPT UP TO 10% IS ALLOWED IN AREA NOTED.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2856-600-1009 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF  
CROSSTUBE PER QSI 035.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE  
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS  
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT  
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1  
THAT WILL BE IN CONTACT WITH THE CROSSTUBE. LET CURE FOR 12 HOURS AFTER  
INSTALLATION AND PRIOR TO PACKAGING.
- 12) INSTALL MS21920-30 CLAMPS (OR -32) WITH D3595-063-570 RUBBER CUSHIONS TO SECURE  
D2896-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE  
CROSSTUBE SUPPORT.
- 13) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY  
AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.
- 14) INSTALL D3606-1 CUFF AFTER CHEMICAL CONVERSION COAT BUT BEFORE PAINT, WITH A  
LAYER OF SIKAFLEX-241/-291 OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT BETWEEN  
CUFF AND CROSSTUBE. SEAL EDGE OF CUFF TO ENSURE NO GAPS.
- 15) TOUCH-UP HOLES WITH CHEMICAL CONVERSION COAT.

SHOP COPY  
RETURN TO  
ENGINEERING  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
M.C. 32184

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07.04.24



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DESIGN

gp

REVISION

1

DATE

07.03.29

DRAWN BY

gp

APPROVED

gp

REV. C

WORK ORDER

2184

DRAWING NO.

D412-664-245

SHEET 2 OF 3

SCALE

1:8

DART AEROSPACE LTD.

HAMPSHIRE, ONTARIO, CANADA

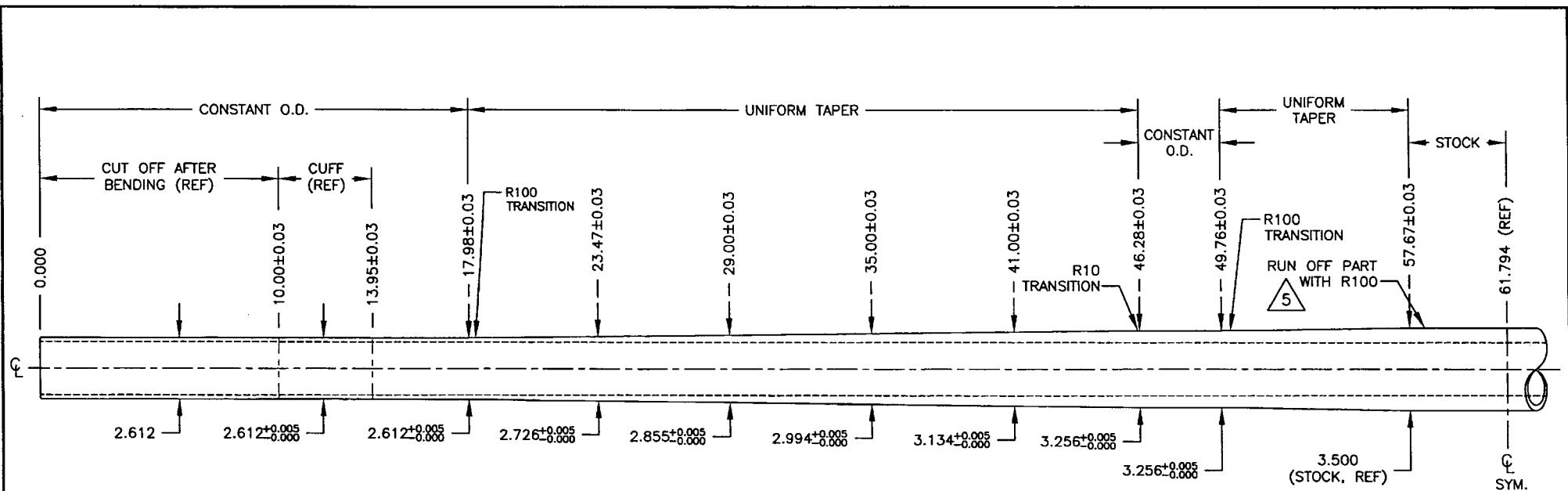
REV. C

SHEET 2 OF 3

SCALE

1:8

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2184



D412-664-245 MACHINING DETAIL

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07.04.19

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WORK ORDER  
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		97	97			REV. C
CHECKED	APPROVED			DRAWING NO.		SHEET 3 OF 3
				D412-664-245		SCALE
DATE		TITLE				1:4
07.03.29		CROSSTUBE (412 LOW-NARROW AFT)				